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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,970	04/13/2004	Hiroyuki Ogawa	AMD-AFO1215	5318

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EXAMINER

HOANG, QUOC DINH

ART UNIT	PAPER NUMBER
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2818

MAIL DATE	DELIVERY MODE
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11/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/823,970	Applicant(s) OGAWA ET AL.	
	Examiner Quoc D. Hoang	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 6-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 6-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Amendment filed on 08/31/2007 has been entered. Claims 1, 3 and 6-8 are pending in the application.

Applicants' remarks have been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka., (US Pat No. 6,756,675) in view of Heim., (US Pat No. 5,248,903).

Regarding claim 1, Tanaka teaches a semiconductor device comprising:

a pad metal layer (100) having a perimeter area and a center area;

a lower metal layer (200) having a plurality of apertures (130a-130i) below said center area of said pad metal layer, wherein said apertures are arranged into a plurality of rows each row comprising more than one of said apertures and a plurality of columns each column comprising more than one of said;

an interlayer dielectric (150) formed between said pad metal layer and said lower metal layer;

a plurality of vias (110a-110d, 112a, 115a, 116a, 117a) formed in said interlayer dielectric, wherein said plurality of vias electrically couple said pad metal layer and said

lower metal layer, and wherein said plurality of vias form a ring arrangement that is located above and outside of the region occupied by the aperture and below the outermost perimeter area of said pad metal layer; and

an protecting film (240) formed that covers said perimeter area of said pad metal layer (col. 6, line 20 through col. 7, line 45 and Figs. 1-2B).

Tanaka teaches the protect film, but fails to teach the protect film is an insulating dielectric layer.

However, Heim teaches film (218) is an insulating dielectric layer (col. 3, line 53 through col. 4, line 57 and Figs. 2A-2B). Since Tanaka and Heim are all from the same field of endeavor, the purpose disclosed by Heim would have been recognized in the pertinent art of Tanaka. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the an insulating dielectric layer on the perimeter area of the pad metal layer in order to define the contact area on the top surface of the metal pad layer as taught by Heim, column 4, lines 10-20.

Regarding claim 3, Tanaka teaches wherein said vias 110a-110d, 112a, 114a, 116a, 117a are filled with tungsten (col. 6, line 55).

Regarding claim 6, Tanaka teaches the bonding wire 180 is connected to the pad metal 100, but does not teach wherein **a probing process** is performed on said center area of said pad metal layer. Although the Tanaka does not teach wherein a probing process is performed on said center area of said pad metal layer, the present of the process limitations on product claims, which product does not otherwise patentably

distinguish over prior art, cannot impart patentability to the product. In re Stephen 145 USPQ 656 (CCPA 1965).

Regarding claim 7, Tanaka teaches the bonding wire 180 is connected to the pad metal 100, but does not teach wherein **a wire-bonding process** is performed on said center area of said pad metal layer. Although the Tanaka does not teach wherein a wire-bonding process is performed on said center area of said pad metal layer, the present of the process limitations on product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to the product. In re Stephen 145 USPQ 656 (CCPA 1965).

Regarding claim 8, Tanaka teaches wherein said semiconductor device is an integrated circuit chip (col. 11, line 28).

Response to Arguments

4. Applicant's arguments filed 08/31/2007 have been fully considered but they are not persuasive.

In response to applicant's argument that Tanaka does not teach or suggest a semiconductor device that includes a plurality of vias formed in an interlayer dielectric that is formed between a pad metal layer and a lower metal layer that has apertures, "wherein said plurality of vias electrically couple said pad metal layer and said lower metal layer, and wherein said plurality of vias form a ring arrangement that is located above and outside of the region occupied by said apertures in said lower metal layer and below an outermost perimeter area of said pad metal layer" as is set forth in Claim 1. The examiner disagrees. Clearly in figure 1, Tanaka teaches a plurality of vias (110a-

110d) formed in said interlayer dielectric, wherein said plurality of vias electrically couple said pad metal layer and said lower metal layer, and wherein said plurality of vias form a ring arrangement that is located above and outside of the region occupied by the aperture and below the outermost perimeter area of said pad metal layer.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the an insulating dielectric layer on the perimeter area of the pad metal layer in order to define the contact area on the top surface of the metal pad layer as taught by Heim, column 4, lines 10-20.

Conclusion

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the


shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571) 272-1657. The fax phone numbers of the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Quoc Hoang
Patent examiner/AU 2818


11/14/2007

QUOC D. HOANG
PRIMARY PATENT EXAMINER